REMARKS

Reconsideration of this application as amended is respectfully requested.

In the Office Action, claims 1- 96 are pending. Claims 1-14, 21-34, 41-54, 61-74 and 81-96 stand rejected. Claims 15-20, 35-40, 55-60 and 75-80 are objected to but would be allowable if rewritten in independent forms. In this response, claims 1, 7, 15, 21-41, 47, 55, 61, 67, 75, 81, 85-89 and 93 have been amended. No new claims have been added. No claims have been canceled. Thus, claims 1-96 remain pending. Support for the amendments can be found throughout the specifications as filed. No new matter has been added. Applicant reserves all rights with respect to the applicability of the Doctrine of Equivalents.

Objections

Objections to the Information Disclosure Statement

The information disclosure statement filed 10/23/2003 is objected to because it allegedly fails to comply with 37 CFR 1.98(a)(2) which requires a legible copy of information to be listed. The Examiner states the cited document "Global Boundary-Centric Feature Extraction and Associated Discontinuity" by Bellegarda has been placed in the application file but the information referred to has not been considered. Applicant respectfully submits that a legible copy of the above cited reference listed in the IDS was previously submitted. Nevertheless, Applicant respectfully resubmits herewith a new copy of the above cited reference in compliance with 37 CFR 1.98(a)(2) for the Examiner's review. In view of the foregoing, Applicant respectfully requests withdrawal of the objection to the IDS and consideration of the information referred to therein.

Objections to the Specification

The disclosure is objected to because of informalities. Paragraph [0020] of the specification as originally filed has been amended with the serial number of the co-filed application. In view of the foregoing amendments, Applicant respectfully submits that the informalities have been corrected. Withdrawal of the objection is respectfully requested.

Objections to the Claims

Claims **7, 27, 47 and 67**

Claims 7, 27, 47 and 67 are objected to because of informalities. Accordingly, claims 7, 27, 47 and 67 have been amended to include the phrase "a plurality of concatenations" as suggested by the Examiner. In view of the foregoing amendments, Applicant respectfully submits that the informalities have been corrected. Withdrawal of the objection is respectfully requested.

Rejections

Double Patenting

Claims 1-96

Claims 1-96 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over parent application 10/693,227. In response, without admitting that this double patenting rejection is proper, Applicant respectfully submits herewith a terminal disclaimer to obviate the provisional double patenting rejection of claims 1-96, as amended, on this basis. In view of the foregoing, Applicant respectfully requests reconsideration and withdrawal of the provisional rejection of claims 1-96, as amended, on this basis.

Rejections under 35 U.S.C. § 101
Claims 21-40, 61-80, 85-88 and 93-96

Claims 21-40, 61-80, 85-88 and 93-96 stand rejected under 35 U.S.C. § 101 because the claimed invention is allegedly directed to non-statutory subject matter. In view of foregoing amendments, Applicant respectfully submits that claims 21-40, 61-80, 85-88 and 93-96, as amended, are directed to statutory subject matter (e.g. a storage medium storing instructions in the case of claim 21) in compliance with the requirements of 35 U.S.C. § 101. Withdrawal of the 35 U.S.C. § 101 rejection is respectfully requested.

Rejections under 35 U.S.C. § 102(b)

Claims 1, 4-10, 21, 24-30, 41, 44-50, 61, 64-70, 81, 85, 89 and 93

Claims 1, 4-10, 21, 24-30, 41, 44-50, 61, 64-70, 81, 85, 89 and 93 stand rejected under 35 U.S.C. § 102(b) as being anticipated by US Patent No. 5,490,234 to Narayan (hereinafter "Narayan"). However, Applicant respectfully submits that claims 1, 4-10, 21, 24-30, 41, 44-50, 61, 64-70, 81, 85, 89 and 93, as amended, are not anticipated by the cited reference.

Specifically, for example, independent claim 1, as amended, includes the limitations:

> "extracting <u>portions from segment boundary regions of a plurality of speech segments,</u> each segment boundary region based on a corresponding initial unit boundary;
> creating <u>feature vectors that represent the portions in a vector space</u>;
> creating <u>concatenation vectors in the vector space, each concatenation vector corresponding to unit boundaries of at least two segment boundary regions,</u> the at least two segment boundary regions being <u>of separate speech segments</u> of the plurality of speech segments;
> for each of a plurality of potential unit boundaries within each segment boundary region, determining an <u>average discontinuity</u> based on <u>distances between the feature vectors and the concatenation vectors,</u> the <u>average being over more than one of the plurality of speech segments</u>; and
> for each segment, selecting the potential unit boundary associated with a minimum average discontinuity as a new unit boundary"
> ("emphasis added")

It is respectfully submitted that Narayan does not teach or suggest the limitations of determining an average discontinuity based on an average distance over more than one speech segments between feature vectors and concatenation vectors, each feature vector representing portions of a speech segment in a vector space, and each concatenation vector corresponding to at least two separate speech segments in the vector space.

Rather, Narayan discloses a blending technique between a last frame of a left diphone and a first frame of a right diphone (Narayan, col. 11, lines 12-17). Narayan teaches extending the last frame into an extended frame (Narayan, col. 11, lines 28-45). The extended frame, according to Narayan, is filtered for discontinuity smoothing (Narayan, col. 11, lines 39-49). In addition, Narayan describes an average magnitude difference between the filtered extended frame and the first frame based on <u>a sequence of points of the extended frame</u> over a window of the sequence (Narayan, col. 11, lines 55-66). Thus, Narayan's technique includes a difference between one diphone and another diphone averaged over a range of points in the sequence of a diphone. However, Narayan does not teach or suggest determining an average

discontinuity based on an average distance over more than one speech segments between feature vectors and concatenation vectors, each feature vector representing portions of a speech segment in a vector space, and each concatenation vector corresponding to at least two separate speech segments in the vector space.

In order to anticipate a claim, each and every limitation of the claim must be taught by the cited reference. It is respectfully submitted that Narayan fails to disclose the limitations set forth above. Therefore, it is respectfully submitted that independent claim 1, as amended, is not anticipated by Narayan.

Independent claims 21, 41, and 61, as amended, include similar limitations as noted above. Therefore, for at least the similar reasons as discussed above, it is respectfully submitted that claims 21, 41, 61, 81, 85, 89 and 93, as amended, are not anticipated by Narayan.

Given that claims 4-10, 24-30, 44-50, 64-70, as amended, depend from and include all limitations of one of independent claims 1, 21, 41 and 61, as amended, Applicant respectfully submits that claims 4-10, 24-30, 44-50, 64-70, as amended, are not anticipated by Narayan.

Rejections Under 35 U.S.C. 103(a)

Claims 2-3, 11, 22-23, 31, 42-43, 51, 62-63 and 71

Claims 2-3, 11, 22-23, 31, 42-43, 51, 62-63 and 71 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Narayan in view of US Patent No. 6,208,967 to Pauws et al. (hereinafter "Pauws"). However, Applicant respectfully submits that Applicant's claims 2-3, 11, 22-23, 31, 42-43, 51, 62-63 and 71, as amended, are patentable over the cited references.

It is respectfully submitted that neither Narayan, nor Pauws, for reasons similar to those discussed above, teach or suggest, individually or in combination, the above noted limitations of independent claim 1, 21, 41 and 61, as amended.

Rather, Pauws describes classifying and segmenting a database of known spoken words into three broad phonetic classes, further segmenting into phoneme-like units using preliminary segmentation positions as anchor points and sequence-constrained vector quantization, and exact tuning to the segmented phonemes through Hidden-Markov Modeling

to compose a diphone for further usage after training (Pauws, Abstract). However Pauws does not teach or suggest determining an average discontinuity based on an average distance over more than one speech segments between feature vectors and concatenation vectors, each feature vector representing portions of a speech segment in a vector space, and each concatenation vector corresponding to at least two separate speech segments in the vector space.

Furthermore, there is no suggestion within Narayan and Pauws to combine with each other. As discussed above, Narayan discloses a blending technique to concatenate one digital frame of a diphone with another digital frame of another diphone. Pauws, however, is related to segmenting speech into phoneme-like units. Clearly, segmenting speech into phonemes is notably different from concatenating diphones of speech. It is respectfully submitted that one with ordinary skill in the art would not, based on the teachings of Narayan and Pauws to combine with each other, because such a combination lacks reasonable expectation of success and each is directed to different goals and hence are incompatible. Any suggestion for such a combination can only be based on the impermissible hindsight of applicants' own disclosure.

Even if they were combined, such a combination still lacks the limitations set forth above. Therefore, it is respectfully submitted that independent claims 1, 21, 41 and 61, as amended, are patentable over Narayan and Pauws.

Given that claims 2-3, 11, 22-23, 31, 42-43, 51, 62-63 and 71, as amended, depend from one of independent claims 1, 21, 41 and 61, as amended, for at least the reasons similar to those discussed above, it is respectfully submitted that dependent claims 2-3, 11, 22-23, 31, 42-43, 51, 62-63 and 71, as amended, are patentable over the cited references.

Claims 12-13, 32-33, 52-53 and 72-73

Claims 12-13, 32-33, 52-53 and 72-73 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Narayan in view of US Patent No. 6,304,846 to Georage et al. (hereinafter "George"). However, Applicant respectfully submits that Applicant's claims 12-13, 32-33, 52-53 and 72-73, as amended, are patentable over the cited references.

It is respectfully submitted that neither Narayan, nor George, for reasons similar to those discussed above, teach or suggest, individually or in combination, the above noted limitations of independent claim 1, 21, 41 and 61, as amended.

Rather, George discloses a method of singing voice synthesis using commercially available MIDI-based music composition software as a user interface (George, Abstract). However George does not teach or suggest determining an average discontinuity based on an average distance over more than one speech segments between feature vectors and concatenation vectors, each feature vector representing portions of a speech segment in a vector space, and each concatenation vector corresponding to at least two separate speech segments in the vector space.

In order to render a claim obvious, each and every limitation of the claim must be taught by the cited references. Therefore, in view of the foregoing remarks, it is respectfully submitted that independent claims 1, 21, 41 and 61, as amended, are patentable over Narayan and George.

Given that claims 12-13, 32-33, 52-53 and 72-73, as amended, depend from one of independent claims 1, 21, 41 and 61, as amended, for at least the reasons similar to those discussed above, it is respectfully submitted that dependent claims 12-13, 32-33, 52-53 and 72-73, as amended, are patentable over the cited references.

Claims 14, 34, 54 and 74

Claims 14, 34, 54 and 74 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Narayan in view of George and further in view of "Modeling Spectral Speech Transitions Using Temporal Decomposition Techniques" by Ahlbom et al (herein after "Ahlbom"). However, Applicant respectfully submits that Applicant's claims 14, 34, 54 and 74, as amended, are patentable over the cited references.

It is respectfully submitted that Narayan, George, for reasons similar to those discussed above, or Ahlbom do not teach or suggest, individually or in combination, the above noted limitations of independent claim 1, 21, 41 and 61, as amended.

Rather, Ahlbom reported a simplified technique for decomposing speech into phone-length temporal events in terms of overlapping and interacting articulatory gestures. (Ahlbom,

Abstract). However, Ahlbom does not teach or suggest determining an average discontinuity based on an average distance over more than one speech segments between feature vectors and concatenation vectors, each feature vector representing portions of a speech segment in a vector space, and each concatenation vector corresponding to at least two separate speech segments in the vector space.

In order to render a claim obvious, each and every limitation of the claim must be taught by the cited references. Therefore, in view of the foregoing remarks, it is respectfully submitted that independent claims 1, 21, 41 and 61, as amended, are patentable over Narayan, George and Alhbom.

Given that claims 14, 34, 54 and 74, as amended, depend from one of independent claims 1, 21, 41 and 61, as amended, for at least the reasons similar to those discussed above, it is respectfully submitted that dependent claims 14, 34, 54 and 74, as amended, are patentable over the cited references.

Claims 82, 86, 90 and 94

Claims 82, 86, 90 and 94 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Narayan in view of Ahlbom. However, Applicant respectfully submits that Applicant's claims 82, 86, 90 and 94, as amended, are patentable over the cited references.

It is respectfully submitted that neither Narayan nor Ahlbom, for reasons similar to those discussed above, teach or suggest, individually or in combination, the above noted limitations of independent claims 81, 85, 89 and 93, as amended.

In order to render a claim obvious, each and every limitation of the claim must be taught by the cited references. Therefore, in view of the foregoing remarks, it is respectfully submitted that independent claims 81, 85, 89 and 93, as amended, are patentable over Narayan and Alhbom.

Given that claims 82, 86, 90 and 94, as amended, depend from one of independent claims 81, 85, 89 and 93, as amended, for at least the reasons similar to those discussed above, it is respectfully submitted that dependent claims 82, 86, 90 and 94, as amended, are patentable over the cited references.

Claims 84, 88, 92 and 96

Claims 84, 88, 92 and 96 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Narayan in view of Ahlbom and further in view of George. However, Applicant respectfully submits that Applicant's claims 84, 88, 92 and 96, as amended, are patentable over the cited references.

It is respectfully submitted that Narayan, Ahlbom or George, for reasons similar to those discussed above, do not teach or suggest, individually or in combination, the above noted limitations of independent claims 81, 85, 89 and 93, as amended.

In order to render a claim obvious, each and every limitation of the claim must be taught by the cited references. Therefore, in view of the foregoing remarks, it is respectfully submitted that independent claims 81, 85, 89 and 93, as amended, are patentable over Narayan, Alhbom and George.

Given that claims 84, 88, 92 and 96, as amended, depend from one of independent claims 81, 85, 89 and 93, as amended, for at least the reasons similar to those discussed above, it is respectfully submitted that dependent claims 84, 88, 92 and 96, as amended, are patentable over the cited references.

Allowable Subject Matter

Claims 15-20, 35-40, 55-60 and 75-80

Applicant thanks the Examiner for indicating that claims 15-20, 35-40, 55-60 and 75-80 contain allowable subject matter if rewritten to include all the limitations of the claims from which they each originally depended. Claims 15, 35, 55 and 75 have been so amended. In view of these amendments, Applicant respectfully submits that independent claims 15, 35, 55, 75 and dependent claims 16-20, 36-40, 56-60 and 76-80, as amended, are in condition for allowance, and request allowance of said claims.

CONCLUSION

In view of the foregoing, Applicant respectfully submits the applicable rejections and objections have been overcome.
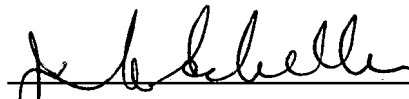
Authorization is hereby given to charge our Deposit Account No. 02 2666 for any charges that may be due. Furthermore, if an extension is required, then applicants hereby request such extension.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN

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